WED-M1V

Veterinary Ultrasound Scanner

User Manual

SHENZHEN WELL.D MEDICAL ELECTRONICS CO. LTD.

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Preface

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Statement

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Manufacturer's warranty

Shenzhen Well.D Medical Electronics Co., Ltd. assumes the responsibility for equipment security, reliability and performance only under the preconditions that the disassembly, assembly and maintenance of the equipment are all performed by its assigned professional and the equipment is used strictly in compliance with the operation manual.

Shenzhen Well.D Medical Electronics Co., Ltd. ensures a guarantee period within a year and a half since the delivery day and promises there is no problem with the new equipment in material and technology. Within the guarantee period, Shenzhen Well.D Medical Electronics Co., Ltd. will maintain the equipment and replace the parts of non-man-made damages free of charge. But will not repair or replace the equipment surface if it is damaged.

This guarantee is only available for failures occurred when the equipment is operated in compliance with the operation manual. And the guaranteed equipment can only be used in the prescribed range given in manual.

This guarantee excludes losses or damages caused by external reasons such as thunder struck, earthquake, theft, unsuitable use or abuse and refitting the equipment.

Shenzhen Well.D Medical Electronics Co., Ltd. shall not be responsible for damages caused by other devices or arbitrary connection to other devices.

Shenzhen Well.D Medical Electronics Co., Ltd. shall not be responsible for losses, damages or injuries caused by delayed service request.

When there is problem with the products, please contact Shenzhen Well.D Medical Electronics Co., Ltd. and explain the equipment model, serial number, date of purchase and the problem.

Note:
The equipment is use only for veterinary.

Matters need Attention

To ensure operational safety and long-term stable equipment performance, please read this operation manual closely and understand the equipment functions, operation and maintenance at all points before operating the equipment, especially contents of "Warning", "Caution" and "Note".

Maloperation or inobservance of the instructions given by manufacturer or its agents may result in equipment damage or personal injury.

The following convention works through this manual to lay special emphasis on some information.

"Warning": Stands for neglect of it will cause severe personal injury, death or realized property loss.

"Caution": Stands for neglect of it will cause slight personal injury or property damage.

"Note": to remind user of installation, operation or maintenance information. These information is very significant but with no risk. Any warning against dangers shall not be contained in NOTE.

Safety labels

Equipment labels explanation:

⚠ Note! Refer to accompanying documents

Signal input

Signal output

IPX7 Protection against dripping water

Class Ⅱ equipment

| Turn-on general supply

○ Disconnect general supply

Packing and transportation labels explanation:

	Handle carefully
	Temperature limit
	Upward
	Piling layer limit
	Keep dry
	Protect against heat

Whole set labels

Refer to Appendix A for equipment labels.

Equipment safety classification:

●According to the degree of safety of application in the presence of a flammable anaesthetic mixture with air or with oxygen or nitrous oxide:

WED-M1V is not suitable for use in the presence of a flammable anaesthetic mixture with air or with oxygen or

nitrous oxide.

●According to the mode of operation:

WED-M1V is in continuous operation.

●According to the degree of protection against harmful ingress of water:

The main unit of WED-M1V is ordinary equipment; the probe is drip-proof equipment.

●According to the type of protection against electric shock:

WED-M1V is the device with internal power supply which is powered by the battery.

●According to the degree of protection against electric shock:

WED-M1V is type b equipment.

General tips for equipment operation

◆In operation

1. After closedown, do not switch on the equipment within 2 - 3 minutes.
2. On scanning, if any abnormal case is found, stop scanning immediately and shut down the equipment.
3. The patient is prohibited to touch any non-applied part of the equipment.
4. When operating, do not press the keyboard panel too much, otherwise the equipment might be damaged.

◆After operation

1. Clean off the couplant on the probe with soft medical sterilized cotton ball.
2. Put the probe into the special case.

General Safety Message

Safety of the operator and patients and reliability of the equipment are taken into consideration during designing and producing, the following safety precaution must be implemented:

1. The equipment shall be operated by qualified operating staff or under their instructions.
2. Do not open the equipment and change the parameters without permission. If necessary, please turn to for Shenzhen Well.D Medical Electronics Co., Ltd. or its authorized agent for service.
3. The equipment has already been regulated into its optimal performance. Do not adjust any preset control or switch unless operate as per instructions in the manual.
4. If there is equipment failure, please shut down the equipment at once and contact for Shenzhen Well.D Medical Electronics Co., Ltd. or their authorized agent.
5. If it is needed to connect the equipment with other company's' electronic or mechanical devices， please contact Shenzhen Well. D Medical Electronics Co,. Ltd. before connection.
6. Equipment operation, storage and transportation environment

Environmental requirements on normal operation:

a) Environment temperature range: 0℃～ +40℃

b) Relative humidity range: ≤80%

c) Atmosphere pressure range: 700hPa～1060hPa

Environment requirements on equipment storage and transportation:

a) Environment temperature range: - 20℃～ +55℃

b) Relative humidity range: ＜80%（20℃）

7. Do not hit the fragile TFT-LCD display. If it cracks, deal carefully with it in case the liquid crystal gets into eyes or mouths.
8. Must not hit the inner chargeable Li-ion battery nor throw it into fire in case it trigger an explosion；Do not short circuit the battery output electrodes in case the battery be damaged; and please use the original binding charger to charge the battery. More over, because used battery will cause environment pollution, please handle the battery correctly for recovery processing.

9. Must not disassemble the power supply adapter. If failures happen, it should be handled by the professional; the charging output can only be used for charging the battery of the equipment, any improper use on other battery may cause explosion, fire and other unexpected hazards.
10. Must not short circuit the output of the adapter，a long term short circuit shall result in adapter damage.
11. Please use standard power cord as the input line of the network power supply for the adapter to reduce risk.
12.Shenzhen Well.D Medical Electronics Co., Ltd. shall not take any responsibility for any risk resulted from unauthorized re-fitment by the users.
13.To disconnect the equipment from the power supply network by unplug the adapter from the power supply network.
14. Refer to appendix B for sound output parameters.

Contraindication

It is suggested not to probe the part with wound or acute inflammation to avoid cross infection.

Chapter One Summary

1.1 Brief Introduction

● This instrument with the probe-main unit integrated, palmtop ultrasound scanning system adopts the microcomputer control, digital scanning converter, wide dynamic range and low-noise pre-amplifier as well as technology such as logarithm compression, dynamic filter, edge enhance. The whole image is clear, stable with high resolution.

● This instrument applies the TFT-LCD displayer of 3.5 inch with the built-in pseudo color processing function and 256 grey –scale. The instrument provides 2 kinds of scanning mode as B mode and M mode to give the following functions: to store , recall ,real time –display, freeze-display, or magnified-display the image; case number annotation; measurement of distance, heart rate, slope and time; measurement of gestational age of pig, horse, cattle, goat, cat and dog with different method.

● Field programmable gate array (FPGA) and surface mounted technology (SMT) are applied in this instrument, so the whole unit is small in volume and light in weight.

● The instrument applies a power supply which combines the built-in lithium ion rechargeable battery and the regular dry battery, while it also supports the power-save mode which is able to prolong the power supplying time.

The instrument is designed for water-proof with injection moulding envelopment and palmtop structure which will help the animal diagnosis.

1.2 Range of application

Suitable for diagnosis on horses, cows, sheep, pigs, cats and dogs and other animals.

1.3 Technical Specificatio

MODEL		WED-M1V
Probe		S2/3.5MHzMechanical sector
Displayed Depth (mm)		160
Maximal detect depth (mm)		≥140
Resolution (mm)	Lateral	≤4(depth≤80)、≤5(80＜depth≤130)
	Axial	≤2(depth≤80)
Blind area (mm)		≤8
Geometric position Precision (%)	Horizontal	≤20
	Vertical	≤10
Monitor size (inch)		3.5 TFT-LCD
Display modes		B、M
Image gray scale		256 级
Image storage		128 pcs
Measure functions		Distance, heart rate, EF, Time, gestation age
Character display		ID
Battery capacity		1550mAh
Mainframe power		5W
Adapter power consumption		80VA
Bulk		171mm×93mm×62mm
Net weight		550g

1.4 Electric principle block diagram

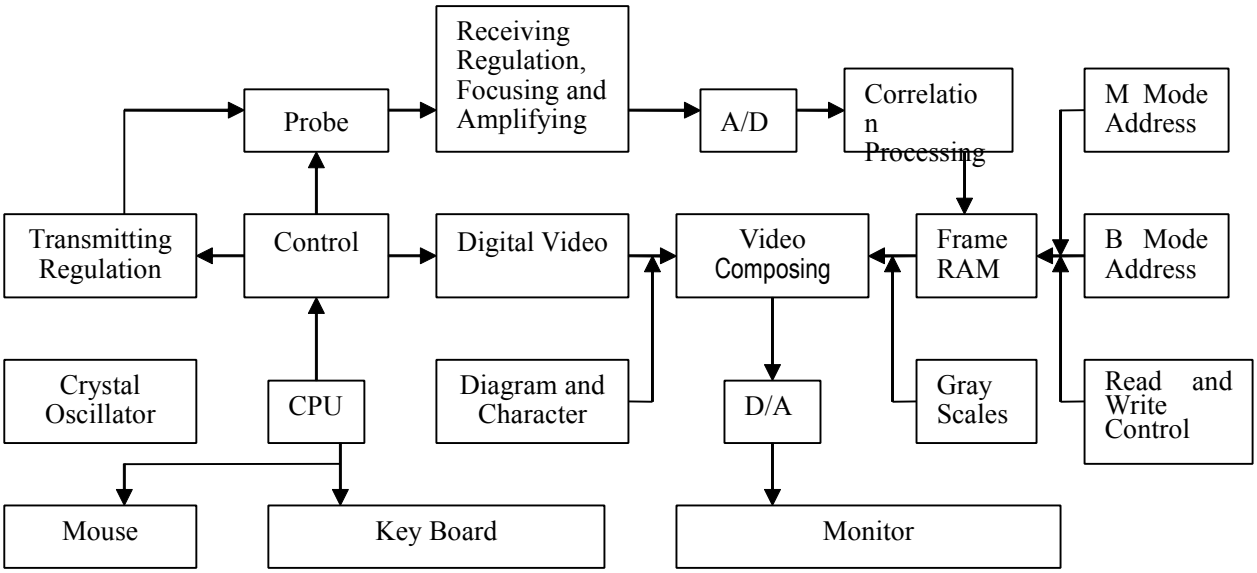


Figure 1-1 Electric principal block diagram

1.5 Basic principle

B-ultrasound works in this following procedure: different tissues of human body possess different densities and speeds of transmission of ultrasound, i.e. different acoustic impedance (product of media density and sound speed).when piezo-chip (transductor) gets certainly regulated electric impulse, it will produce ultrasound with certain frequency. when this ultrasound (sound energy) is injected into human body, different organ surfaces will produce reflection echo, the different size reflection is received by the transductor which emitted ultrasound and is changed into electric impulse, when this electric impulse is amplified, demodulated, digital scanned, shifted and some other handling, video standard signal is produced and organ cross-sectional images are displayed on the monitor.

1.6 Device constituent

1.6.1 Standard layout pieces

- ◆Mainframe(containing a piece of Li-ion battery)
- ◆Manual/ technical instructions
- ◆SP-2 power adapter(containing power cord)
- ◆Testing Report
- ◆Packing list

1.6.2 Fitting pieces

- ◆Li-ion battery
- ◆Car charger
- ◆Charging adaptation wire

Warning:

Please select spare parts models prescribed above. The manufacturer will not assume the risks such as safety problem, non-expected drop of EMC performance that cause by arbitrary adoption of spare parts out of prescription.

1.7 Appearance

Figure 1-2 Appearance dimension sketch

Warning
Working in intense electromagnetic environment, its images may be interfered and the diagnoses may be affected. By this time, stop operating to avoid misdiagnosis. Reuse after the electromagnetic interference is removed.

Warning
Working when the device is overlapped with other devices or close to others might cause unexpected EMC problems; If they have to be put together, please check every one to ensure no one is affected by unexpected EM coupling.

Warning
Replacement of parts that not according with specs or connection to other devices might cause unexpected EMC problems. The possibility of unexpected EM coupling effect should be testifies carefully.

Chapter Two Installation

2.1 Operating environmental requirements

1. Environment temperature range：0℃～+40℃
2. Relative humidity range：≤80%
3. Atmosphere pressure range：700hPa～1060hPa

When using, avoid strenuous vibration, keep it away from devices with high field, intense magnetic field or high voltage; avoid strong sunlight blazing down on the display; keep the device well-ventilated, moisture proof and dustproof.

2.2 Unpacking inspection

After unpacking, check the device according to "Packing List" and install it according to requirements and methods described in "Installation" after affirm that there is no shipping damage.

Warning
If there is breakage at unpacking check, it is banned to use the device to ensure security.

2.3 Installation and disassembly

2.3.1 Probe Replacement

The probe of this instrument should be detached and replaced by the professional maintainer of our company or the professional maintainer authorized by our company . It is not allowed for the users to detach or replace the probe without permission, or else it might cause the hidden danger.

2.3.2 Loading and Unloading of Battery

Unloading of the WED-M1V Battery: Remove the 4 screws fixing the battery by the plus driver, then unplug the battery with force.

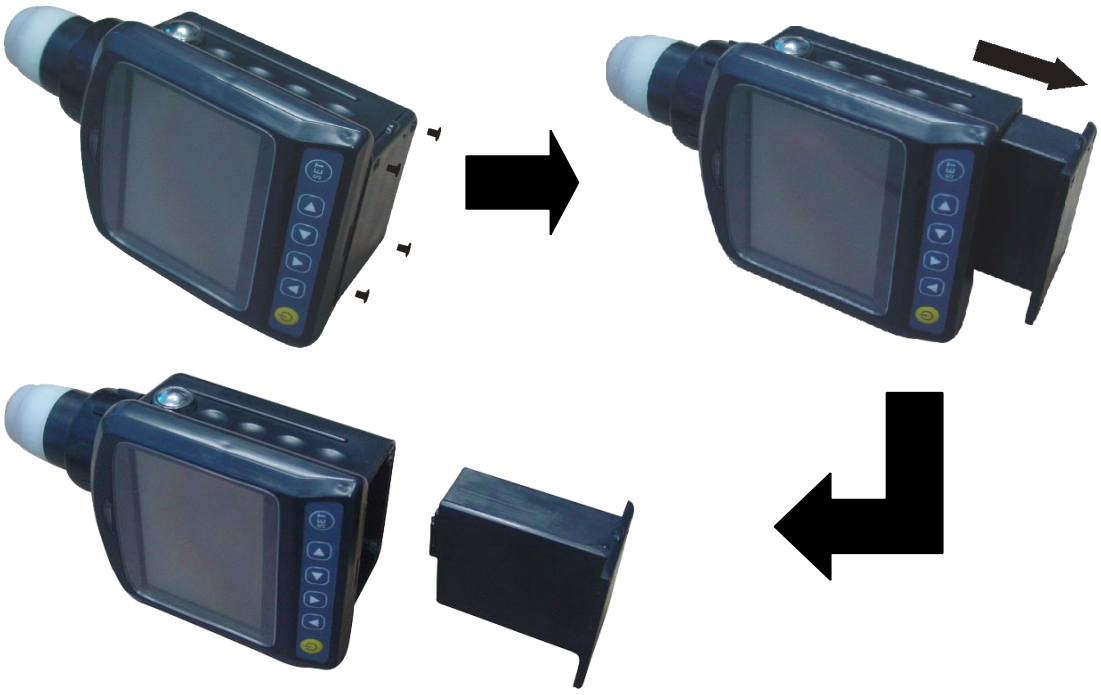


Fig.2-1 Schematic Diagram for Battery Disassembly

The loading of battery is a reversed process of the unloading.

Note
When the screen displays the battery in the empty status, it indicates that the battery power s running out and it should be charged as soon.

Warning
Other than the adapter within the standard configuration is not to be used as the power supply when using the external power supply.

2.4 Battery Charging

When the main unit displays the battery in the empty status in the right top corner of the display screen, it indicates that the batter should be charged. The battery should be charged via the charging adapter cable.

2.4.1 Charging through adaptive line

1. Take out the battery from the main unit or take out the spare battery.

2. Connect the round end of the adaptive line to the "⎓12.6V/1A" terminal of the adapter, and the flat end to the charging terminal of the battery.

3. Connect power cord of "~100-240V 50/60Hz" of the adapter to the AC EPS.

4. When the "POWER" indicator light on the adapter turns into red, the battery is in charging; when the "POWER" indicator light turns into green, the battery is fully charged. (Refer to figure 2-5).

Figure 2-2. Charging through adaptive line

2.4.2 Charging through auto-charger

1. Take out the battery from the main unit or take out the spare battery.
2. Connect the flat end marked with an arrow of the auto-charger to the charging terminal of the battery.
3. Plug the other end of the auto-charger into the cigar lighter socket.
4. When the "Charging" indicator light on the adapter turns into red, the battery is in charging; when the "Charging" indicator light turns into green, the battery is fully charged.

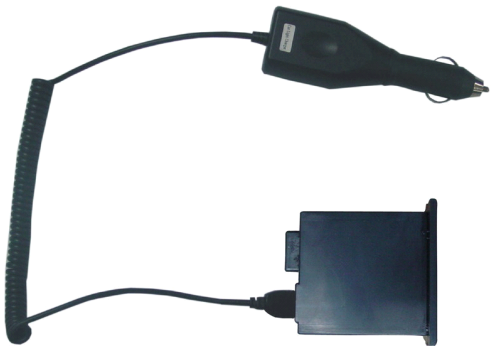


Figure 2-3. charging through auto-charger

Tips:

1. The input voltage of the auto-charger is DC9～14V/1.5A.

2. The output voltage of the auto-charger is DC12.6V/1A.

3. The operations and storage environment are the same as those of the main unit.

Note
To avoid the battery failure, the battery should be charged and discharged once per 3 months.

Chapter Three Operation Procedures

3.1 Keyboard Function

The keyboard of the WED-M1V is given as the following picture.

Fig. 3-1 Schematic Diagram for Operating Panel

Image Freeze Button

It is on the right side of this instrument, and you can press this button to freeze or activate the image.

Instrument ON/OFF Button

Press this button to turn on turn off the instrument. If the instrument “Crashes” (No button is available) due to unexpected reason or the operating mistake, you can press this button to restart the instrument.

These Buttons have multiple functions.

- When the measurement cursor s displayed, press them to move the measurement cursor.
- When the menu the recalled out, press buttons to select the submenu.
- When the menu is recalled out, press the button to exit the menu.
- When the menu s recalled out, press the to enter into the submenu.
- When the parameter setting item is activated, press buttons to set the specific parameters.
- Under the real-time status, press buttons to change the image depth.
- Under the real-time status, press button to switch between the B mode and M mode.

SET Image Parameter Setting Button

- You can press the button under the real-time status to make setting to the probe frequency, overall gain, brightness and pseudo color.
- You can press this button under the freeze status to perform the operations such as distance measurement, image saving and recalling, obstetric measurement, annotation inputting, setting to character color on screen and clearance of the image memory.

3.2 Starting Instrument

Press the button to turn on the power supply of the main unit, then the power indicator on the panel will light, and the initial screen will come out. Now you can press any button (Except) to enter into the scanning working status. You can adjust the brightness and the overall gain to make the image quality meet the visual requirement of users.

Fig. 3-2 Initial Screen

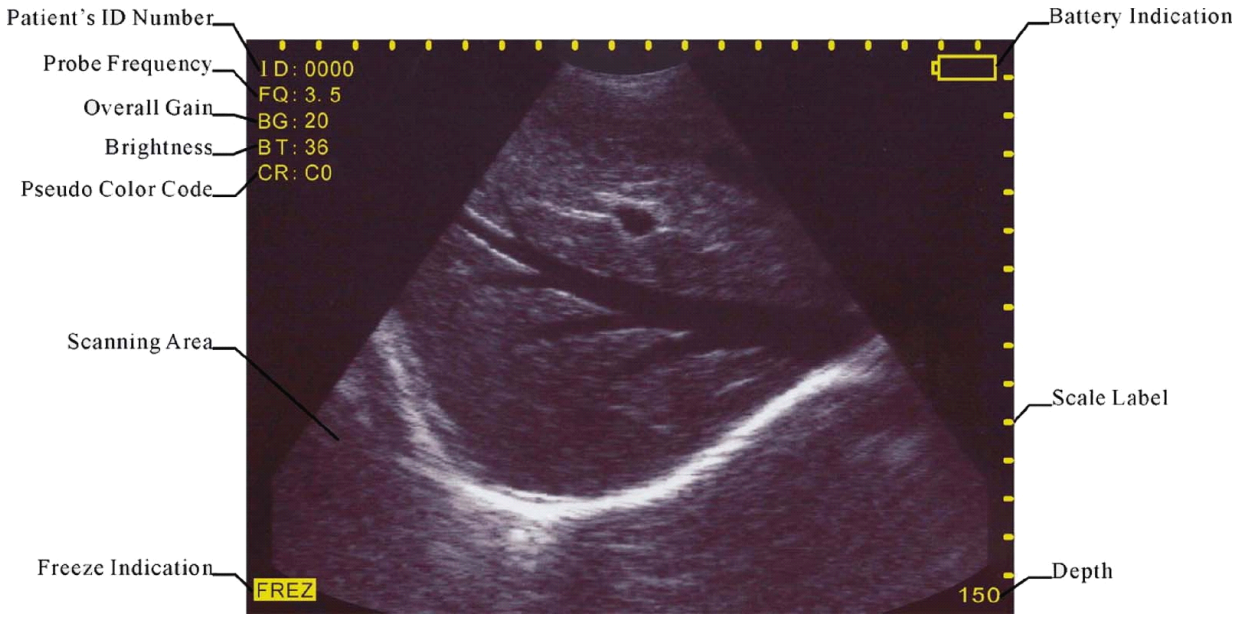


Fig. 3-3 Screen Displaying

3.3 Adjustment of Image Parameters

Probe Frequency Change

Press the SET button under the real-time scanning status, “FQ”in the left top corner of the screen will light, then you can press the ◀ or ▶ buttons to change the probe frequency circularly within the adjustment range of 2.5MHz、3.5MHz、5.0MHz.

Overall Gain Adjustment

Press the SET button under the real-time canning status, “BG”in the left top corner of the screen will be lighted, then you can press the ◀ or ▶ buttons to increase or decrease the overall gain within the adjustment of 0～40.

Adjustment of Image Brightness

Press the SET button under the real-time scanning status, “BT” in the left top corner of the screen will be lighted, the you can press the ◀ or ▶ buttons to increase or decrease the brightness within the adjustment range of 20～50.

Pseudo Color Adjustment

Press the SET button under the real-time scanning status, “CR” in the left top corner of the screen will be lighted, then you can press the ◀ or ▶ to adjust the pseudo color circularly.

The pseudo color codes and the corresponding color are given as follows:

C0 ---Black & White

C1 --- Red

C2 --- Yellow & Green

C3 --- Blue

Depth Adjustment

You can press the ▲、▼ buttons under the B mode real-time scanning status to change the image depth within the adjustment range of 90mm～160mm.

Mode Switch

You can pres the ◀ button under the real-time status to switch between the B mode and the M mode.

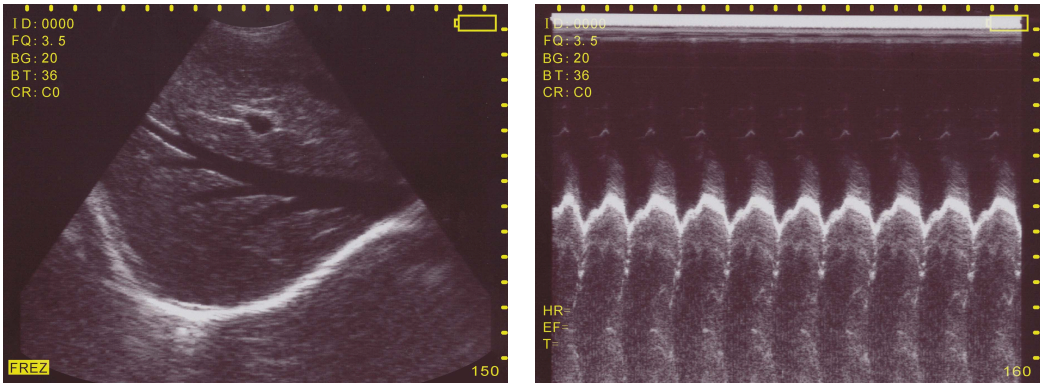
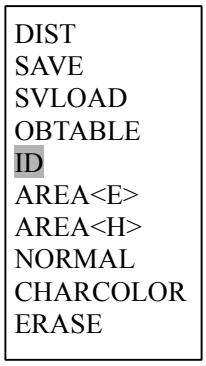


Fig. 3-4 Scanning Mode

3.4 Inputting ID Number

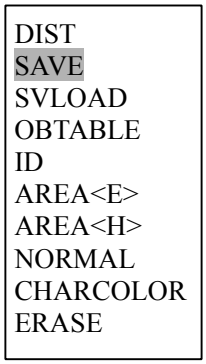
Enter into the freeze status, then press the SET button to display the main menu, and press the ▲、▼ button to select "ID" and press the ▶ button confirm it. The ID includes 4 figures, and you can input the figures individually to input the ID number while the currently inputted one will be underlined as I D : 0 0 0 0. Now you can press the ▲ or ▼ button to select the wanted number. You can also press ◀ or ▶ buttons to change the other figures, then press the SET button to confirm and exit after inputting.



3.5 Imaging Storing

● First please freeze a wanted picture, then press the SET button to display the main menu, select "SAVE" and press the ▶ button to confirm it. Now the currently saved picture's number will be displayed in the bottom portion of the screen as "SAVING •••••• 01". The picture saving is finished when the information note disappears.

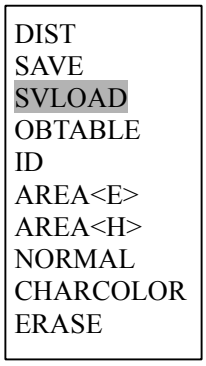
● You can repeat the above mentioned operation procedure to continue image saving, and the system will encode them automatically in the saving sequence. When the number of 00-20 is full of saved image, if saving more pictures, the system will begin to saving image from 21th. This instrument can store a maximum of 128 pictures. When the memory reaches the full capacity, if to save more pictures, the screen will display a prompt box as FULL.ERASE NO.001 to ask you if to cover the picture of No.001. You can press the SET button to select YES, or press the other button to select NO. If continue to save more pictures, the system will also ask you if to cover the picture of NO.002, and infer from this.



3.6 Image Recall

● Press the SET button under the freeze status, then select "SVLOAD" and press the ▶ button, the screen will display LOAD IMAGE NO.001 in the bottom part. Input the image code such as 001(Please refer to 3.4 ID Number Inputting for the method of number inputting),then you can press the SET button to recall out the No.1 Picture after inputting, while the currently displayed picture and the memory capacity will be displayed in the left bottom corner of the screen as 001/127. Now you can press the ▲or ▼ buttons to recall out the pictures in the normal sequence or the reversed sequence.

● You can also repeat the above procedures to continue picture recalling.

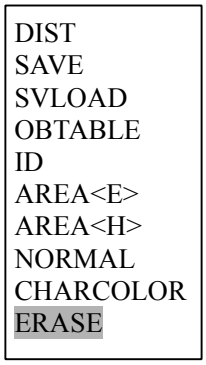


Tips

- ***The system is unable to perform the image recalling to the storage area where no picture has been saved.***
- ***The inputted code number should in the range of 000-127, and when the inputted number***

is over 127, the system will not perform any operation.

3.7 Image Clearance

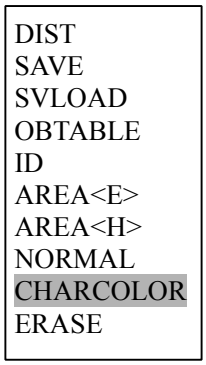


● When the image memory reaches the full capacity, you need to make clearance to the memory manually for the future image saving.

● Operating Procedures: Freeze the picture, then press the SET button to select the "ERASE", now the screen will display ERASE ALL? at the bottom. You can press the SET button to select YES, and the screen's bottom will display ERASING •••••• which indicates that the pictures is being cleared off. When the prompt box disappears, t indicates that all pictures have been cleared off, now you can press the other buttons to exit the operation.

Note
Do not perform the other operations during picture clearance.

3.8 Color Setting of Screen Characters



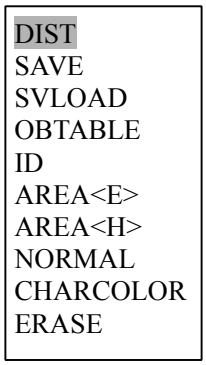
Enter into the freeze status, then press the SET button to display the main menu, press the ▲、▼ buttons to select "CHARCOLOR" and press ▶ button to make confirmation. You can change the color of the characters on the screen by perform this operation circularly.

3.9 Preset Function

Press the SET button, a menu will pop out, while in this menu, 2 items as "AREA<E>"、"AREA<H>" are for the preset function without available function currently.

3.10 Distance Measurement

This instrument is able to take measurement to 4 groups of distance with the unit of mm. The operating procedures are given as follows:



1. Set the instrument into the B mode freeze status, then press the SET button to display the main menu;
2. Select "DIST", and press the ▶ button to display the measurement cursor(▲、▼、◀、▶ will function as the direction buttons after the cursor is displayed);
3. Move the cursor the starting point of the measured distance, then press the SET button to confirm this starting point;
4. Press the direction button to display another cursor, move the cursor to the ending point of the measured

distance, then press SET button to finish this measurement and display another measurement cursor.

5. Repeat the procedures of 3~4 to start another measurement.

The 4 groups of data will be displayed in the left portion of the screen listed as D1、D2、D3、D4. You can press the button to clear the creeen.

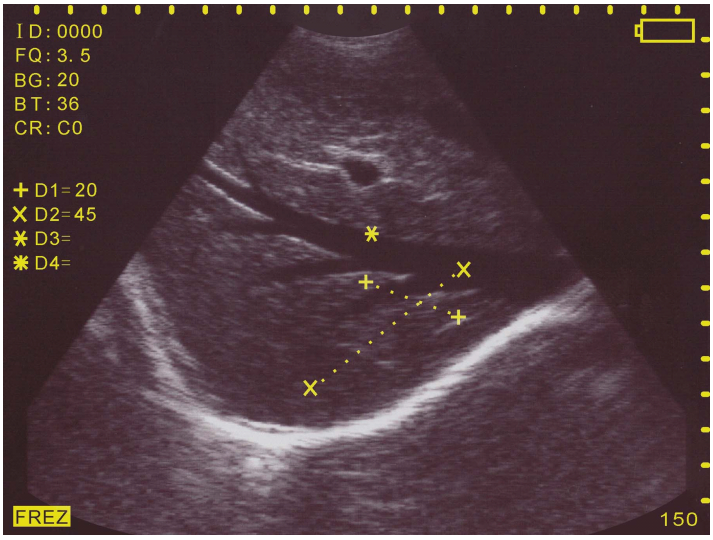


Fig.3-5 Schematic Diagram for Distance Measurement

3.11 Heart Measurement

The measurement of heart includes the measurement to the heart rate, slope and time, and the detailed operating procedures are given as follows:

1. Enter into the freeze status under the B mode, then press SET button to display the main menu;
2. Select "DIST" and press the button to display the measurement cursor;
3. Measure the peak-to peak distance with the method of distance measurement, and 3 groups of data will be displayed in the left portion of the screen as :

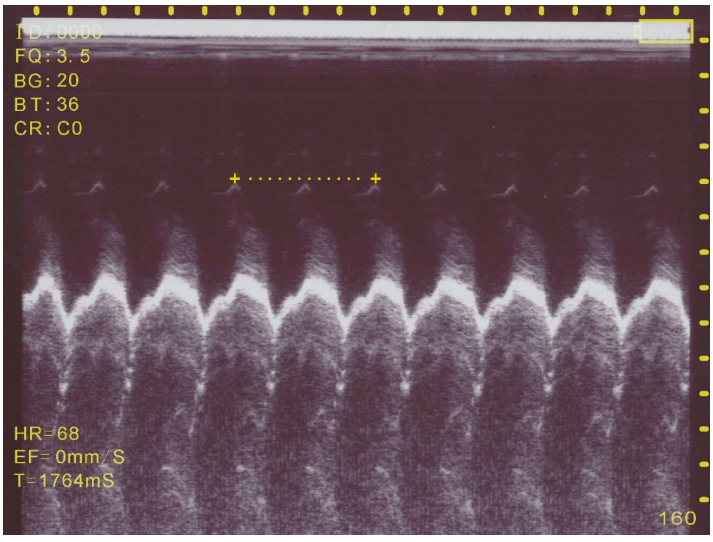


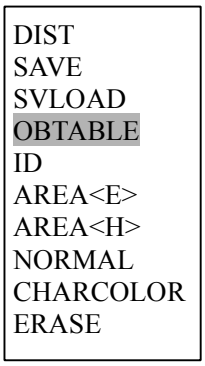
Fig. 3-6 Schematic Diagram for Heart Measurement

Heart rate HR(Unit: Times/min),Slope EF (Unit: mm/s), Time T(Unit: ms).

3.12 Obstetric Measurement

This instrument provides the measurement function to exam the animal's gestational age such as pig, horse, cattle, goat, cat and dog. After measurement to the parameters such as heart length (HL), gestational sac (GS), body length (BL), stomach length(SL), umb-spine distance (USD), head diameter(HD), biparietal diameter(BD), crown-rump length (CRL) , the instrument will display the corresponding gestational age(gestational week) automatically.

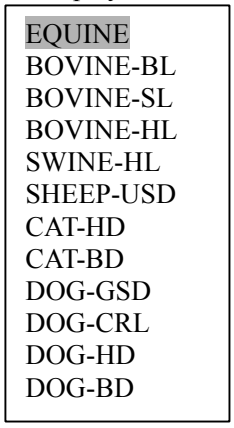
Operating procedures:



Enter into the freeze status, then press the

button and select the "OBTABLE" to call out the obstetric table. Now you can press the 、 button to select the wanted measurement item. The currently selected item will be lighted , then you can press the button to enter int the measurement.

After selecting the corresponding animal's obstetric table, then you can take measurement to the distance value of selected parameter according to the method of distance measurement, and the corresponding gestational age data will be displayed in the left portion of the screen automatically.



3.12.1 EQUINE：Calculate the gestation age according to horse GS

Examination steps on equine:

1. Clear off the egesta in rectum.
2. Feel the pregnancy with hand and give a primary estimation and confirm the examing organ with ultrasound.
3. Hold the probe closely and and put it into rectum and ensure that your hand can feel the coming change inside recta. Keep hand closing to the back and between the probe and recta wall.
4. The inner construction of equine displays on the screen, bladder lies in the portrait cross place and the behind is uterine horns and body. From the horizontal view, uterine horns are in shape of round usually. Move the probe around to acquire a better observation on the joint of uterine horns and body, and then switch the probe to uterine horns.
5.The measurement method of GS diameter is given below and measurement can be done horizontally or vertically.

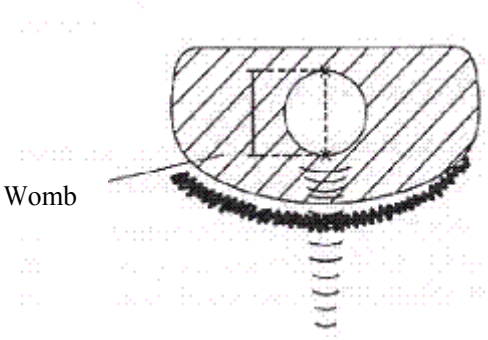


Figure 3-7. Equine GA measurement

6. Confrim the distance value as per distance measurement methods and the corresponding data display behind "G·A". With this measurement to set up a chart to find the growth curves to estimate embryo size and GA.Here GA refers to the duration from the copulation instead of impregnation.

3.12.2 BOVINE-BL：Calculate the gestation age according to bovine BL

Examination steps on bovine:

1. Clear off the egesta in rectum.
2. Feel the pregnancy with hand and give a primary estimation and confirm the examing organ with ultrasound.
3. Hold the probe closely and and put it into rectum and ensure that your hand can feel the coming change inside recta. Keep hand closing to the back and between the probe and recta wall.
4. The inner construction of bovine displays on the screen, bladder lies in the portrait cross place and the behind is uterine horns and body. From the horizontal view, uterine horns are in shape of round usually. Move the probe around to acquire a better observation on the joint of uterine horns and body, and then switch the probe to uterine horns .
5. To measure the fetus body diameter, select a vertical section first, that is a section from two side to the neck, chest and abdomen. Body diameter can be acquired when the GA is between 60 to 150 days.

The measurement method of ody diameter is given below:

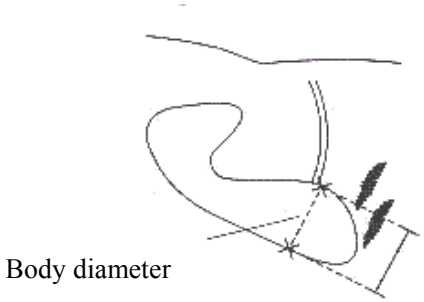


Figure 3-8. BL measurement

6. Confrim the distance value as per distance measurement methods and the corresponding data display behind "G·A".

3.12.3 BOVINE-SL：Calculate the gestation age according to bovine SL

1. Keep the cow standing.
2. Put the probe against the abdomen side center, shift it a little bit left or right and hold it closely against the skin. Clean the abdomen skin if there is mud to ensure a clear display of the abdominal pelvic structure.
3. The maximum vertical axile of the stomachi should be displayed on the screen. With the time going on, futus stomachi long axile increases regularly. The measuremenet method is given below:

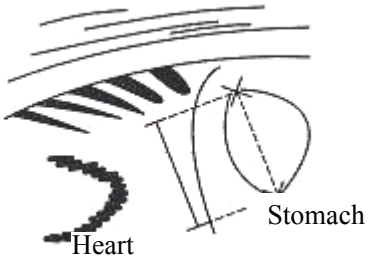


Figure 3-9. Buvine stomachi measurement

4. Confrim the distance value as per distance measurement methods and the corresponding data display behind "G·A".

3.12.4 BOVINE-HL：Calculate the gestation age according to bovine HL

1. Keep the cow standing.

2. Put the probe against the abdomen side center, shift it a little bit left or right and hold it closely against the skin. Clean the abdomen skin if there is mud to ensure a clear display of the abdominal pelvic structure.

3. The maximum vertical axile of the heart should be displayed on the screen. With the time going on, futus heart long axile increases regularly. The measuremenet method is given below:

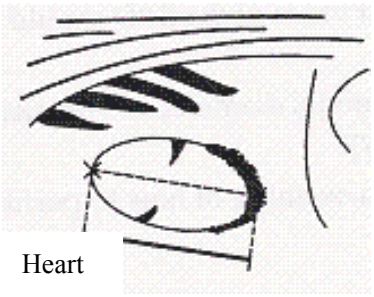


Figure 3-10. Buvine heart measurement

4. Confrim the distance value as per distance measurement methods and the corresponding data display behind "G·A".

3.12.5 SWINE-HL：Calculate the gestation age according to SWINE HL

Check routine on pigs:

1. Make the swine in a state of stand.

2. Put the probe, a little bit left or right of the centre, on the ventral abdominal wall closely along the side of teats and skull to rear leg. If the is mud on this part, clean with water first incase the abdomen pelvic structure could not be displayed accurately.

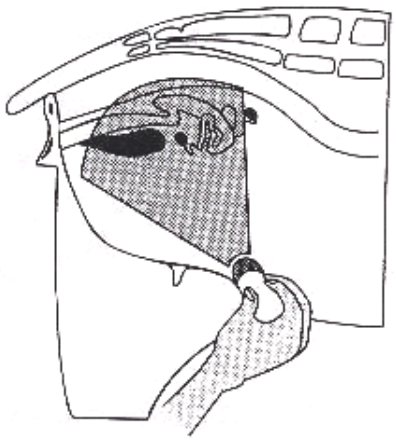


Figure 3-11. Swine GA measurement

3. To measure the heart macro-axis, screen should display the maximal longitudinal axis of heart. With the growth of gestation age, the fetal heart macro-axis increase regularly. Measuring method is given in the following figure:

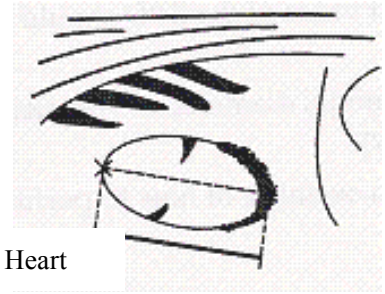


Figure 3-12. Swine Heart measurement

4. Measure selected parameter distance according to distance measurement method, the corresponding gestation age data will automatically shows behind " G·A ".

3.12.6 SHEEP-USD：Estimate gestation age according to hilum-spine length of sheep

There are two methods to exam pregnant sheep:

Use the probe to check abdomen. These two methods are the same usful. It is proofed as cording to some publication that these two methods are the same effective in pregnancy examination.

- — Rectum exmanination is more exact than abdomen examination within first 35 days pregnancy;
- — The two methods are the same effective between 35 to 70 days pregnancy;
- — After 70 days pregnancy, abdomen examination is better because it is more practical when the uterine becomes large.

This device only supports Abdomen check, Steps are as follows:

1. Abdomen examination can be done when the sheep is standing or lying or seating. Put the probe against the appointed abdomen center where there is no fur.
2. Clean the abdomen skin if there is mud to ensure a clear display of the abdominal pelvic structure.
3. Measure the length of USD.
4. Confrim the distance value as per distance measurement methods and the corresponding data display behind “G·A”.

3.12.7 CAT-HD：Calculate the gestation age according to cat HD

Head diameter refers to the maximum inner skull diameter from the side of abdomen to back. This value can be acquired within 8 month pregnancy.

The HDmeasurement is given below:

Figure 3-13. Cat HD measurement

3.12.8 CAT-BD：Calculate the gestation age according to cat BD

After fetal head formed, binary top diameter measurement becomes a routine in ultrasonic examination.The measuring method is:

1. Fetal head axial plane scanning, look for BPD measuring standard plane from top to bottom.
2. According to distance measurement method to measure distance of selected parameters, the corresponding gestation age data will automatically show behind " G·A".

3.12.9 DOG-GSD：Calculate the gestation age according to dog gestation saccus diameter

The method is the same as that of equine.

3.12.10 DOG-CRL：Calculate the gestation age according to dog CRL

The method is the same as that of cow.

3.12.11 DOG-HD：Calculate the gestation age according to dog HD

The method is the same as that of cat.

3.12.12 DOG-BD：Calculate the gestation age according to BD

The method is the same as that of cat.

Tips:After display the OB menu, press ***key to exit.***

Note
At OB measurement, when the distance is less than the following value, the GA of this animal will not display. Refer to the following table for detailed data:

EQUINE	D1<6mm
BOVINE – BL	D1<8mm
BOVINE – SL	D1<1mm
BOVINE – HL	D1<3mm
SHEEP	D1<15mm
SWINE	D1<31mm
CAT – HD	D1<15mm
CAT – BD	D1<17mm
DOG – GSD	D1<1mm
DOG – CRL	D1<1mm
DOG – HD	D1<14mm
DOG – BD	D1<16mm

3.13 Shut down

Press key to shut down the device.

Chapter Four Transportation and Storage

4.1 Environment requirements on transportation and storage

Environment temperature range：- 20℃～ +55℃
Relative humidity range：＜80%（20℃）

4.2 Transportation

Signs on the packing box conform to 《Iconograph and sign of packing, storage and transportation》（GB/T191-2008）. Simple shockproof establishment is fitted within the box, which apply to aviation, railway, and highway or steamship transportation. Keep dry, inversion and collision.

4.3 Storage

The equipment should be taken out from the packing when storage time exceeds six months, power on it for four hours, and then pack it correctly and keep it in a warehouse. The equipment must not be piled, and do not place it closely against the floor, walls or roof.

Keep it well ventilated, do not expose it to strong sunlight or caustic gases.

Chapter Five Check and Maintenance

5.1 Service life

Bases on the manufacturer's design, production related files, this model's use life is six years. The Product's material will gradually aging, if the product continually use over the designed use life, it may bring the problem of the performance reduced and fault rate raise.

Note:
The Discard the equipment according to local law. **Do not discard it mixing with other household garbage.**

Warning:
The manufacturer shall not assume the responsibility of risks caused by using the equipment beyond its service life.

5.2 Check

Check the device power cord and probe cable and waterproof cover, if find any damage or breakage, must not use the device and replace the broken immediately.

Check if the probe and main unit are connected rightly.

Check the adapter EPS regularly, when the supply voltage exceeds specified accommodation limit (AC100V-240V±10%, 50/60Hz),Do not supply the main unit or charge the battery with adapter.

Check the adapter power cord and probe cable, if find any damage or breakage, replace the broken immediately.

Adapter is the dedicated power of the device, it adopts omniseal insulation design, do not replace it with other adapters or attempt to open it incase there be any hazard.

5.3 Main unit maintenance

Instrumentation environment should accord with "2.1 operation environmental requirement".

If device enclosure needs cleaning，shutdown the device first and then wipe with alcohol sponges.

Device should not turn on and off frequently.

When the device does not work for a long time, pack the device according to the instructions on the packing. Store it properly in the warehouse. The storage environment should accord with "4.1 Transportation and storage environmental requirements".

5.4 Probe maintenance

Probe is an expensive part and frangible. Never hit it or drop it on floor.

Please use medical ultrasound couplant during diagnoses. Do daily inspection on the probe enclosure to see if it is cracked and avoid liquid leakage to spoil the built-in components

Check the probe regularly to see if it is filled with clean medical castor oil lest the existing air bubbles influence the image quality. If air bubbles appear, turn the probe oil filler hole up and screw off the sealing screw, turn the probe slowly to drive the air bubbles to the screw hole, infuse a little bit of castor oil into the screw hole with syringe with a needle (refer to figure 5-1), vent the air bubbles and fasten the sealing screw and finally clean the oil stain on the probe surface.

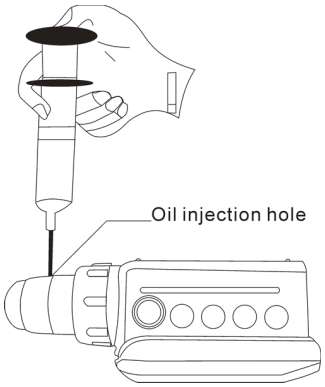


Figure 5-1 Mechanical sector scan probe oil injection

5.5 Cleansing

1.When the enclosure need cleaning, wipe it with soft dry cloths and then wipe gently with sponge dipped with 75% medical alcohol .

2. This instrument applies the waterproof probe, so you can clean it with water washing or wipe it the wet cloth.

Warn
To avoid accident, please cut off the network power supply when cleaning the envelopment of the adapter. **Do not splash water or immerse plugs and sockets in the water during all kinds of cleaning.**

Warn
Do not use the paint, ethylene oxides or other organic solvent, or else it will damage the protective coating on the probe surface. **Do not let any liquid permeate into the instrument or probe.** **Do not use the gas or heating method to clean the instrument and probe.**

Be Cautious
1. Please refer to the instruction given by the manufacture thoroughly when using the detergent. **2. The displayer screen is likely to be scratched and damaged, thus it should be wiped with soft and dry cloth.** **3. Do nor clean the internal part of the instrument.** **4. Do nor immerse the instrument into the liquid.** **5. Make sure no residual detergent on the surface of the instrument.** **6. Though the envelopment of this instrument will not take actions with most detergent, it is recommended to not to use detergent freely, or else t might cause the damage to the instrument envelopment.**

5.6 Correct usage of probe

In order to prolong probe's service life and obtain optimum performance， follow these instructions:

1. Periodic inspection on probe cable, socket and acoustic window.

2. Do not drop probe or flint body， and never hit the probe acoustic window, otherwise probe should be damaged.

3. Never heat the probe.
4. Use couplant only on probe header and then clean probe.
5. Inspect probe acoustical window, enclosure and cable seriously after probe cleaning. Never use the probe again if any crack or breakage is found.

5.7 Battery information

1. The equipment is fitted with rechargeable li-ion battery.
2. For optimum efficiency, the new battery must be charged and discharged (regular service， not enforced discharging) two or three rounds completely.
3.The battery can be charged and discharged for hundred times， but it will be worn-out. When the work time shortens apparently, please replace it with a new one.
4. Be sure to use electricity charger appointed by Shenzhen Well.D Medical Electronics Co., Ltd. (i.e. AC adapter) to charge the battery. Do not connect the battery to the electricity charger (AC adapter) when charging is not needed. Do not connect the battery to the electricity charger (AC adapter) longer than 10 hours; otherwise the battery life may shorten. The fully charged battery will discharge by itself if it is long-time out of use.
5.The battery should be charged and discharged once in every 3 months to prevent it unuseful.
6. Extreme environment temperature (overcooling or overheating) will influence battery charging effect. Must not charge the battery near the ignition source or under extreme hot condition! Do not use or store battery near source of heat (such as fire or heater)! If find the battery is leaking or smelling, move the battery away from the naked flame immediately.
7. Don’t go on using non-serviceable battery and electricity charger (AC adapter).
8. Don't try demounting battery.
9. Don't short circuit the battery.
10. Do not throw the battery into the fire or heat it, otherwise it would trigger an explosion.
11. Do not souse or wet the battery.
12. Do not incorrectly connect the positive and negative polarity.
13. Do not directly connect the battery to wall outlet or car-lit socket.
14. Must not short circuit the positive and negative polarity of the battery with led or other metal objects. Must not transport nor store the battery with necklace, hair pin or other metal objects.
15. Must not pierce battery shell with nail or other sharp objects, must not hammer nor step on the battery.
16. Must not hit, cast the battery and avoid mechanical shock on it.
17. Must not bead the battery terminals.
18. Must not decompound the battery in any way.
19. Must not place the battery in microwave oven or pressure vessels.
20. Must not combine the battery with primary battery (such as dry battery) or battery with different capacity, models and types.
21. Do not use the battery if it is smelling, heating, straining, discolored or with other abnormal phenomena and remove it from the current consumer or electricity charger immediately and stop using it any longer.
22. Do deal carefully with the discarded battery according to local related waste handling regulations.

Chapter Six Simple Trouble Shooting

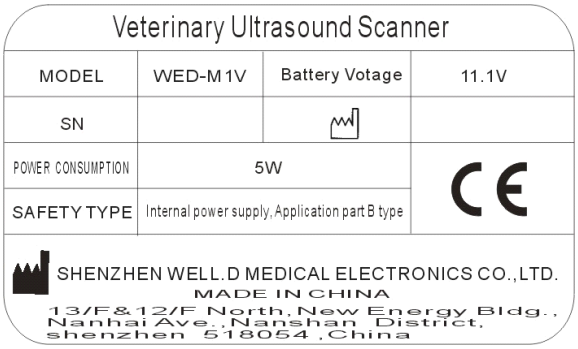
If malfunction occurs with this instrument, you can take the simple measurement according to the following table.

If the malfunction still exists, please contact Shenzhen Welld Electronics Co.,Ltd.

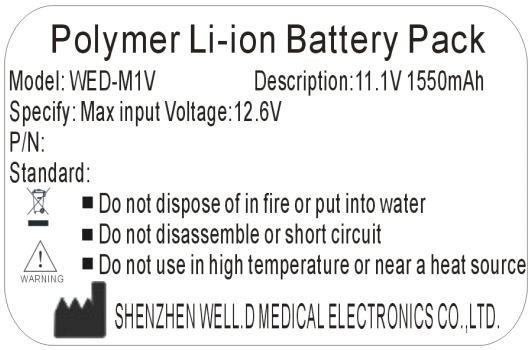
Number	Simple Malfunction Symptom	Eliminating Method
1	Indicator light of the power adapter can not be lighted	1. Check the power supply; 2. Check the power cable and plug of adapter.
2	Indicator light of main unit can nor be lighted	1. Charge the battery again; 2. Replace with the new battery with full power.
3	Interruptive barred interference and snow like interference appear on the screen	1. Check the power supply of adapter, it might be cause by the strike interference from the other instrument; 2. Check the environment to see if there is any electric or magnetic interference around the instrument;
4	The image on the screen is not clear	1. Adjust the overall gain; 2. Adjust the brightness.

Appendix A Labels Diagram

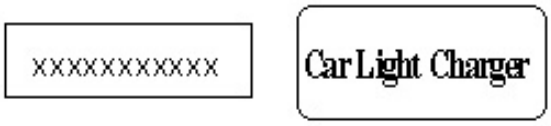
1. Equipment nameplate diagram



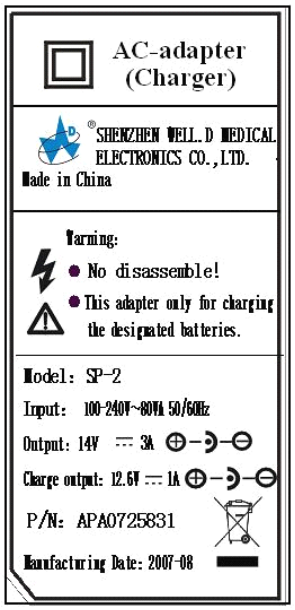
2. Battery nameplate diagram


Polymer Li-ion Battery Pack
Model: WED-M1V
Description:11.1V 1550mAh
Specify: Max input Voltage:12.6V
P/N:
Standard:
■ Do not dispose of in fire or put into water
■ Do not disassemble or short circuit
■ Do not use in high temperature or near a heat source
WARNING
SHENZHEN WELL.D MEDICAL ELECTRONICS CO.,LTD.

3. Auto-charger nameplate diagram



4. Adapter nameplate diagram



Modification on the above information may not be further notified.

Appendix B Acoustic output reporting table

Index	MI	TIS	TIS	TIS	TIB	TIB	TIC
Mode	—	Scanning	Non-scanning Aaprt≤1 cm^2	Non-scanning Aaprt＞1cm^2	Scanning	Non-scanning	—
Acoustic working frequency (MHz)	3.24	3.24	-	3.65	3.24	3.65	
Output power (mw)			-	0.05		0.05	-
Bounded output Power (mw)		18.3			18.3		
Attenuated output power (mw)				0.02		0.01	
Spatial-peak temporal-average intensity(mw/cm^2)				0.15		2.22	
Attenuated spatial-peak temporal-average intensity(mw/cm^2)				0.08		0.07	
Pulse-intensity integral(μj/cm^2)	30.16					35.10	
Attenuated Pulse-intensity integral(μj/cm^2)	11.78					11.84	
Peak-rarefactional acoustic pressure (MPa)	1.23						
Attenuated peak-rarefactional acoustic pressure (MPa)	0.76						
-1 2dB output beam area (cm^2)			-	2.16			-
Equivalent aperture diameter (cm)				1.66			-
Depth for TIS (cm)				2.5			
Depth for TIB (cm)						4.3	
Depth at max. attenuated pulse-intensity integral (cm)	4.2						
Supplementary information： （a） Transducer Model：S2-3.5MHz； （b） Transducer serial No.：AP0530546.							

Index	MI	TIS	TIS	TIS	TIB	TIB	TIC
Mode	—	Scanning	Non-scanning Aaprt≤1 cm^2	Non-scanning Aaprt＞1cm^2	Scanning	Non-scanning	—
Acoustic working frequency (MHz)	4.20	4.20	-	4.17	4.20	4.17	
Output power (mw)			-	0.02		0.02	-
Bounded output Power (mw)		28.8			28.8		
Attenuated output power (mw)				0.01		0.006	
Spatial-peak temporal-average intensity(mw/cm^2)				0.05		1.09	
Attenuated spatial-peak temporal-average intensity(mw/cm^2)				0.03		0.28	
Pulse-intensity integral(μj/cm^2)	56.08					17.53	
Attenuated Pulse-intensity integral(μj/cm^2)	13.53					4.51	
Peak-rarefactional acoustic pressure (MPa)	1.36						
Attenuated peak-rarefactional acoustic pressure (MPa)	0.66						
-1 2dB output beam area (cm^2)			-	1.02			-
Equivalent aperture diameter (cm)				1.14			-
Depth for TIS (cm)				1.7			
Depth for TIB (cm)						4.7	
Depth at max. attenuated pulse-intensity integral (cm)	4.9						
Supplementary information： （a） Transducer Model：S2-5.0MHz； （b） Transducer serial No.：AP0570204.							

Appendix C Gestational Table

Gestational Table 1: Equine

Measurement(mm) (Gestational Sac Diameter)	Week	Day
6	1	4
8	1	4
10	1	5
12	1	6
14	1	6
16	2	0
18	2	0
20	2	1
22	2	2
24	2	3
26	2	5
28	4	1
30	4	2
32	4	3
34	4	4
40	5	0
42	5	2
44	5	3
46	5	4
48	5	5
50	5	6
52	6	1
54	6	2
56	6	3

All measurements +/- 3 days

Gestational Table 2: Bovine

Measurement(mm) (Body Length)	Week	Day
8	4	0
10	5	0
12	5	1
14	5	2
16	5	3
18	5	5
20	5	5
22	5	6
24	5	6
26	6	1
28	6	1
30	6	1
32	6	2
34	6	3
36	6	3

All measurements +/- 3 days

Gestational Table 3: Sheep

Measurement(mm) (Umbilicus to Spine Distance)	Week	Day
15	7	1
18	7	3
21	7	6
24	8	1
27	8	4
30	9	0
33	9	2
36	9	4
39	10	0
42	10	2
45	10	5
48	11	3
51	11	5
54	12	1
57	12	2
60	12	4
63	12	6
66	13	2
69	13	4
72	14	2
75	14	4
78	15	0
81	15	2
84	15	5
87	16	6
90	17	0
93	17	1
96	17	3
99	17	6

All measurements +/- 3 days

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